WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a first semiconductor substrate;

a second semiconductor substrate different in lattice constant from said first semiconductor substrate, said second semiconductor substrate being bonded to said first semiconductor substrate; and

an amorphous layer made of constituent atoms of said first and second semiconductor substrates and formed at an interface between said first and second semiconductor substrates.

2. The device according to claim 1, wherein one of said first and second semiconductor substrates includes a light-emitting layer.

3. The device according to claim 1, wherein said first semiconductor substrate is an InP substrate including a compound semiconductor layer of zero layers or one or more layers and said second semiconductor substrate is a GaAs substrate including a compound semiconductor layer of zero layers or one or more layer.

4. The device according to claim 3, wherein a compound semiconductor layer of said first semiconductor substrate is made of $In_{1-x}Ga_xAs_yP_{1-y}$ (x and y are numbers from zero to one).

5. The device according to claim 3, wherein a compound semiconductor layer of said second

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semiconductor substrate is made of $Al_xGa_{1-x}As$ (x is a number from zero to one).

6. The device according to claim 1, wherein said amorphous layer has a thickness of 1 nm or more.

7. A manufacturing method of a semiconductor device, said method comprising:

a first step of pressing, onto each other, surfaces of first and second semiconductor substrates different in lattice constant, so that they are bonded to each other; and

a second step of treating, with heat, said first and second semiconductor substrates bonded, so as to form an amorphous layer at an interface between said first and second semiconductor substrates.

8. The method of according to claim 7, wherein said first and second semiconductor substrates are treated at a temperature of 550 ℃ or higher for one hour or longer in said second step.

9. The method according to claim 7, wherein one of said first and second semiconductor substrates includes a light-emitting layer.

10. The method according to claim 7, wherein said first semiconductor substrate is an InP substrate including a compound semiconductor layer of zero layers or one or more layers and said second semiconductor substrate is a GaAs substrate including a compound semiconductor layer of zero layers or one or more layer.

11. The method according to claim 10, wherein a compound semiconductor layer of said first semiconductor substrate is made of $In_{1-x}Ga_xAs_yP_{1-y}$ (x and y are numbers from zero to one).

12. The method according to claim 10, wherein a compound semiconductor layer of said second semiconductor substrate is made of $Al_xGa_{1-x}As$ (x is a number from zero to one).

13. The method according to claim 7, wherein said amorphous layer has a thickness of 1 nm or more.

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